THAT WHICH IS CLAIMED:

SUB A1

1. A method of protecting selected portions of a metal substrate from chemical exposure, comprising:

applying a maskant coating composition to at least a portion of the surface of a metal substrate, the maskant composition being radiation curable and substantially solvent-free;

exposing the coated substrate to actinic radiation to cure the maskant composition and form a cured peelable maskant film adhered to the metal substrate; and

subjecting the coated substrate to a chemical treatment.

2. The method of Claim 1, wherein the metal substrate is selected from the group consisting of aluminum, steel, titanium and alloys thereof.

3. The method of Claim 1, wherein the maskant composition comprises at least one polymerizable monomer or oligomer and a photoinitiator.

4. The method of Claim 3, wherein the at least one polymerizable monomer or oligomer is selected from the group consisting of acrylates, diacrylates, urethane acrylates or diacrylates, and mixtures thereof.

5. The method of Claim 3, wherein the at least one polymerizable monomer or oligomer is selected from the group consisting of isobornyl acrylate, isooctyl acrylate, aliphatic urethane acrylate, aliphatic polyester-based urethane acrylate, aromatic urethane acrylate, siliconized urethane acrylate, polybutadiene urethane diacrylate, and mixtures thereof.

6. The method of Claim 3, wherein the photoinitiator is selected from the group consisting of 1-hydroxycylohexyl phenyl ketone, bis (2,6-dimethoxybenzoyl)-2,4-,4-trimethylpentyl phosphine oxide, 2-hydroxy-2-methyl-1-phenyl-propan-1-one,

trimethylbenzophenone, methylbenzophenone, bis acyl phosphine oxide, and mixtures thereof.

7. The method of Claim 3, wherein the maskant composition further comprises a filler.

8. The method of Claim 7, wherein the filler is selected from the group consisting of talc and fumed silica.

9. The method of Claim 1, wherein said exposing step comprises exposing the coated substrate to ultraviolet radiation, black light radiation or visible light radiation.

10. The method of Claim 1, wherein said exposing step comprises exposing the coated substrate to ultraviolet radiation by moving the substrate past at least one ultraviolet light or moving the ultraviolet light past the substrate.

11. The method of Claim 1, wherein said exposing step comprises exposing the coated substrate to at least one ultraviolet radiation source having a wavelength of about 200 nm to about 450 nm and an intensity of about 120 W/cm to about 185 W/cm.

12. The method of Claim 1, wherein said exposing step comprises exposing the coated substrate to radiation at a rate of about 1 to about 10 feet of substrate/minute.

13. The method of Claim 1, wherein the cured maskant film has a thickness of about 5 to about 20 mils.

14. The method of Claim 1, wherein the cured maskant film has a peel strength of about 3 oz./inch to about 30 oz./inch.

15. The method of Claim 1, wherein said applying step comprises applying the maskant composition by spraying the composition, applying the composition with a

roller, applying the composition with a blade, or by dipping the substrate in the maskant composition.

16. The method of Claim 1, wherein the metal substrate has a first side and a second side, and said method comprises:

applying the maskant coating composition to at least a portion of the first side of the metal substrate;

exposing the first coated side of the substrate to actinic radiation to cure the maskant composition and form a cured peelable maskant film adhered to the first side of the metal substrate;

applying the maskant coating composition to at least a portion of the second side of the metal substrate; and

exposing the second coated side of the substrate to actinic radiation to cure the maskant composition and form a cured peelable maskant film adhered to the second side of the metal substrate.

17. The method of Claim 1, wherein the chemical treatment is selected from the group consisting of chemical milling, anodizing and deoxidizing.

18. The method of Claim 1, wherein said subjecting step comprises immersing the substrate in a chemical bath.

19. A method of protecting selected portions of a metal substrate from chemical exposure, comprising:

applying a maskant coating composition to at least a portion of the surface of a metal substrate;

curing the maskant coating composition to form a cured peelable maskant film adhered to the metal substrate;

scribing a predetermined pattern of lines in the maskant film, the scribed lines outlining portions of the maskant film to be removed;

applying a sealant composition to the scribed lines in the maskant film, the line sealant composition being radiation curable and substantially solvent-free;

exposing the line sealant composition to actinic radiation to cure the line sealant composition;

peeling off a portion of the maskant film outlined by the scribed lines; and

subjecting the coated substrate to a chemical treatment.

20. The method of Claim 19, wherein the line sealant composition comprises at least one polymerizable monomer or oligomer and a photoinitiator.

21. The method of Claim 20, wherein the at least one polymerizable monomer or oligomer is selected from the group consisting of acrylates, diacrylates, urethane acrylates or diacrylates, and mixtures thereof.

22. The method of Claim 20, wherein the at least one polymerizable monomer is selected from the group consisting of isobornyl acrylate, isooctyl acrylate, urethane acrylate, and mixtures thereof.

23. The method of Claim 20, wherein the photoinitiator is selected from the group consisting of bis acyl phosphine oxide, 1-hydroxycyclohexyl phenyl ketone, and mixtures thereof.

24. The method of Claim 20, wherein the line sealant composition further comprises a wax and a synergist.

25. The method of Claim 24, wherein the synergist is triethanolamine.

26. The method of Claim 19, wherein said step of applying the line sealant composition comprises applying the sealant composition with a roller or applying the sealant composition with cheesecloth.

27. The method of Claim 19, wherein said step of exposing the line sealant composition to actinic radiation comprises exposing the sealant composition to ultraviolet radiation, black light radiation or visible light radiation.

28. The method of Claim 19, wherein said step of exposing the line sealant composition to actinic radiation comprises exposing the sealant composition to a radiation source emitting radiation at a wavelength of about 200 to about 450 nm and having an intensity of about 100 W/cm to about 600 W/cm.

29. The method of Claim 19, wherein the metal substrate is selected from the group consisting of aluminum, steel, titanium and alloys thereof.

30. The method of Claim 19, wherein said step of applying a maskant coating composition comprises applying a radiation curable and substantially solvent-free maskant composition and said step of curing the maskant composition comprises exposing the maskant composition to actinic radiation to form a cured peelable maskant film adhered to the metal substrate.

31. The method of Claim 30, wherein the maskant composition comprises at least one polymerizable monomer or oligomer and a photoinitiator.

32. The method of Claim 31, wherein the at least one polymerizable monomer or oligomer is selected from the group consisting of acrylates, diacrylates, urethane acrylates or diacrylates, and mixtures thereof.

33. The method of Claim 31, wherein the at least one polymerizable monomer or oligomer is selected from the group consisting of isobornyl acrylate, isooctyl acrylate, aliphatic urethane acrylate, aliphatic polyester-based urethane acrylate, aromatic urethane acrylate, siliconized urethane acrylate, polybutadiene urethane diacrylate, and mixtures thereof.

34. The method of Claim 31, wherein the photoinitiator is selected from the group consisting of 1-hydroxycylohexyl phenyl ketone, bis (2,6-dimethoxybenzoyl)-2,4-,4-trimethylpentyl phosphine oxide, 2-hydroxy-2-methyl-1-phenyl-propan-1-one, trimethylbenzophenone, methylbenzophenone, bis acyl phosphine oxide, and mixtures thereof.

35. The method of Claim 31, wherein the maskant composition further comprises a filler.

36. The method of Claim 25, wherein the filler is selected from the group consisting of talc and fumed silica.

37. The method of Claim 30, wherein said step of exposing the maskant composition to actinic radiation comprises exposing the maskant composition to ultraviolet radiation, black light radiation or visible light radiation.

38. The method of Claim 30, wherein said step of exposing the maskant composition to actinic radiation comprises exposing the maskant composition to ultraviolet radiation by moving the substrate past at least one ultraviolet light or moving the ultraviolet light past the substrate.

39. The method of Claim 30, wherein said step of exposing the maskant composition to actinic radiation comprises exposing the maskant composition to at least one ultraviolet radiation source having a wavelength of about 200 nm to about 450 nm and an intensity of about 120 W/cm to about 185 W/cm.

40. The method of Claim 30, wherein the maskant composition is exposed to radiation at a rate of about 1 to about 10 feet of substrate/minute.

41. The method of Claim 30, wherein the cured maskant film has a thickness of about 5 to about 20 mils.

42. The method of Claim 30, wherein the cured maskant film has a peel strength of about 3 oz./inch to about 30 oz./inch.

43. The method of Claim 30, wherein said step of applying a maskant composition comprises applying the maskant composition by spraying the composition, applying the composition with a roller, applying the composition with a blade, or by dipping the substrate in the maskant composition.

44. The method of Claim 30, wherein the metal substrate has a first side and a second side, and said method comprises:

applying the maskant coating composition to at least a portion of the first side of the metal substrate;

exposing the first coated side of the substrate to actinic radiation to cure the maskant composition and form a cured peelable maskant film adhered to the first side of the metal substrate;

applying the maskant coating composition to at least a portion of the second side of the metal substrate; and

exposing the second coated side of the substrate to actinic radiation to cure the maskant composition and form a cured peelable maskant film adhered to the second side of the metal substrate.

45. The method of Claim 19, wherein the chemical treatment is selected from the group consisting of chemical milling, anodizing and deoxidizing.

46. The method of Claim 19, wherein said subjecting step comprises immersing the substrate in a chemical bath.

47. The method of Claim 19, wherein said scribing step comprising scribing lines with a knife or a laser.

48. A method of protecting selected portions of a metal substrate from chemical exposure, comprising:

applying a maskant coating composition to at least a portion of the surface of a metal substrate, the maskant composition being ultraviolet radiation curable and substantially solvent-free;

exposing the coated substrate to ultraviolet radiation to cure the maskant composition and form a cured peelable maskant film adhered to the metal substrate, the maskant having a peel strength of about 3 oz./inch to about 30 oz./inch;

scribing a predetermined pattern of lines in the maskant film, the scribed lines outlining portions of the maskant film to be removed;

applying a sealant composition to the scribed lines in the maskant film, the line sealant composition being radiation curable and substantially solvent-free;

exposing the line sealant composition to actinic radiation to cure the line sealant composition;

peeling off a portion of the maskant film outlined by the scribed lines; and

immersing the substrate in a chemical milling bath.

49. The method of Claim 48, wherein the metal substrate is an aluminum airplane fuselage panel.

50. A coated metal substrate, comprising

a metal substrate having an outer surface;

a maskant film adhered to at least a portion of the outer surface of said metal substrate, the maskant film having a pattern of scribed lines therein; and

a radiation-cured and substantially solvent-free line sealant applied to said scribed lines in said maskant film.

51. The coated metal substrate of Claim 50, wherein said line sealant comprises at least one radiation-cured polymer component.

52. The coated metal substrate of Claim 51, wherein said at least one radiation-cured polymer component is selected from the group consisting of poly(acrylates), poly(diacrylates), poly(urethane acrylates or diacrylates), and mixtures thereof.

53. The coated metal substrate of Claim 50, wherein said line sealant was cured by ultraviolet, black light or visible light radiation.

54. The coated metal substrate of Claim 50, wherein said maskant film is a radiation-cured and substantially solvent-free maskant film.

55. The coated metal substrate of Claim 54, wherein said maskant film has a thickness of about 5 to about 20 mils.

56. The coated metal substrate of Claim 54, wherein said maskant film comprises at least one radiation-cured polymer component.

57. The coated metal substrate of Claim 56, wherein said at least one radiation-cured polymer component is selected from the group consisting of poly(acrylates), poly(diacrylates), poly(urethane acrylates or diacrylates), and mixtures thereof.

58. The coated metal substrate of Claim 56, wherein said maskant film is ultraviolet radiation cured.

59. The coated metal substrate of Claim 56, wherein said maskant film further comprises a filler.

60. The coated metal substrate of Claim 59, wherein said filler is selected from the group consisting of talc and fumed silica.

61. The coated metal substrate of Claim 54, wherein said maskant film has a peel strength of about 3 oz./inch to about 30 oz./inch.

62. The coated metal substrate of Claim 50, wherein said metal substrate is selected from the group consisting of aluminum, steel, titanium and alloys thereof.

63. The coated metal substrate of Claim 50, wherein the metal substrate is an aluminum airplane fuselage panel.